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10/568,788	10/03/2006	Roy Derrick Achilles	930092-2028	6410

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EXAMINER

FULLER, ROBERT EDWARD

ART UNIT	PAPER NUMBER
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3676

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/568,788	Applicant(s) ACHILLES, ROY DERRICK	
	Examiner ROBERT E. FULLER	Art Unit 3676	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input checked="" type="checkbox"/> Other: <u>Exhibits A and B</u> . |

DETAILED ACTION

1. Applicant's submission, filed May 7, 2009, has been carefully considered. Examiner has withdrawn the claim objection and the rejections under 35 U.S.C. 112 and 102(f) set forth in the previous Office Action. However, with respect to the prior art, examiner maintains the rejections set forth in the previous Office action.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, 6-8, 10-12, 15-19, and 22-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Oles (US 6,344,149).

With regard to claims 1 and 11, Oles discloses a polycrystalline diamond abrasive element, comprising a layer of polycrystalline diamond (64) bonded to a substrate (62) along an interface, the polycrystalline diamond layer having a working surface opposite the interface and an outer peripheral surface (66) extending between the working surface and the interface, the polycrystalline diamond abrasive element having a region rich in catalyzing material (see Exhibit A, attached to this Office Action) and an annular region adjacent the peripheral surface extending away from the working surface toward but stopping short of the interface (see Exhibit A), the annular region or

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a substantial portion thereof being located between at least a portion of the region rich in catalyzing material and the peripheral surface and being lean in catalyzing material (see column 7, lines 26-39).

With regard to claims 2, 12, and 19, the polycrystalline diamond layer also has a region adjacent the working surface which is lean in catalyzing material (see Exhibit A).

With regard to claim 6, the catalyzing material is present as a sintering agent in the manufacture of the polycrystalline diamond layer (see column 4, lines 47-52).

With regard to claims 7, 15, 22, and 23, since the particle size within the catalyst-rich region is variable, the catalyst-rich region inherently has many regions which differ in average particle size (see column 1, lines 32-38).

With regard to claims 8, 16, and 24, the element is a cutter.

With regard to claims 10, 18, and 26, Oles discloses a cemented carbide substrate (see column 5, lines 8 and 9).

With regard to claims 17 and 25, the cutting element is secured to a bit (see column 4, lines 26-30).

4. Claims 1-3, 6-8, 10-13, 15-20, 22-31, and 33-36 are rejected under 35 U.S.C. 102(e) as being anticipated by Matthias et al (US 6,601,662).

With regard to claims 1, 11, 19, and 27, Matthias discloses a polycrystalline diamond abrasive element (10), comprising a layer of polycrystalline diamond (see Exhibit B, attached to this Office Action) bonded to a substrate (32) along an interface, the polycrystalline diamond layer having a working surface opposite the interface and an outer peripheral surface extending between the working surface and the interface,

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the polycrystalline diamond abrasive element having a region rich in catalyzing material and an annular region adjacent the peripheral surface extending away from the working surface toward but stopping short of the interface, the annular region or a substantial portion thereof being located between at least a portion of the region rich in catalyzing material and the peripheral surface and being lean in catalyzing material (see Exhibit B).

With regard to claims 2, 12, and 28, there is also a region adjacent the working surface lean in catalyzing material (see Exhibit B).

With regard to claim 3, 13, 20, and 31, Matthias discloses a depth of 100 micrometers (see column 13, lines 18-27).

With regard to claims 6 and 33, Matthias discloses a sintering agent (column 4, lines 8-13).

With regard to claims 7, 15, 22, 23, and 34 the region rich in catalyzing material comprises different regions (see Exhibit B), which will inherently have different properties, because the diamond layer is not perfectly homogeneous.

With regard to claims 8, 16, 17, 24, 25, and 35, the element is a cutting element secured to a bit.

With regard to claims 10, 18, 26, and 36, the substrate is cemented tungsten carbide (see column 16, line 11).

With regard to claim 29, the catalyst-lean regions are contiguous (see Exhibit B).

With regard to claim 30, the region near the working surface is not as deep as that proximate the peripheral surface (see Exhibit B).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4, 14, 21, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matthias et al (US 6,601,662).

Matthias discloses that the thickness of the catalyst-rich region should be at least 150 micrometers (see column 14, lines 43-48).

It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have provided at least 500 micrometers of catalyst-rich material, since Matthias teaches a thickness of *at least* 150 micrometers, therefore one skilled in the art would provide a thickness greater than this, presumably as thick as 500 micrometers depending on the abrasiveness of the formation being drilled, as it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

7. Claims 3, 4, 13, 14, 21, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oles in view of Matthias et al.

Oles discloses a region lean in catalyzing material that extends to at least half way through the diamond layer, but fails to disclose the precise depth of the layer.

Matthias discloses a layer (80) in a PCD cutter element that is lean in catalyzing material. Matthias states that this layer should be about 100 micrometers (see column

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13, lines 18-22). Matthias also states that at least 150 micrometers of the layer rich in catalyzing material should be left (see column 14, lines 43-48). However, Matthias does not state that at least 500 micrometers of catalyst-rich material should be left.

It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have made the thickness of the lean region of Oles to be between 30 and 500 micrometers, since Matthias teaches that a thickness value (100 micrometers) which falls within that range is the optimal value (see Matthias, column 13, lines 18-22). Also, it would have been obvious to have provided at least 500 micrometers of catalyst-rich material, since Matthias teaches a thickness of *at least* 150 micrometers, therefore one skilled in the art would provide a thickness greater than this, presumably as thick as 500 micrometers, depending on the abrasiveness of the formation being drilled, as it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oles in view of Jurewicz et al. (US 6,202,770).

Oles fails to disclose the polycrystalline diamond layer having a bevel at the peripheral edge.

Jurewicz discloses a PDC cutter having a beveled edge (see Figure 5).

It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have modified Ole's insert to have a beveled edge,

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since Jurewicz teaches that the bevel "protected the cutting edge from load-induced stress concentrations" (see column 4, lines 17-25).

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matthias et al. in view of Jurewicz et al.

Matthias fails to disclose the polycrystalline diamond layer having a bevel at the peripheral edge.

Jurewicz discloses a PDC cutter having a beveled edge (see Figure 5).

It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have modified the element of Matthias to have had a beveled edge, since Jurewicz teaches that the bevel "protected the cutting edge from load-induced stress concentrations" (see column 4, lines 17-25).

Response to Arguments

10. Applicant's arguments filed May 7, 2009 have been fully considered but they are not persuasive. Applicant has argued, essentially, that Oles does not teach an annular region that stops short of the interface and that Matthias does not disclose annular regions at all.

Examiner respectfully traverses these arguments. The language of the diamond layer "having" a lean "region" and a rich "region" is broad, and allows the examiner to define "regions" in an arbitrary manner, so long as a portion of those regions are actually lean or rich in catalyzing material, respectively. The more narrow language of the diamond layer "consisting of" a lean region and a rich region would preclude the examiner from defining the regions arbitrarily. If the "consists of" language is used, then

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the examiner would have to consider the *entire* portion of lean material as forming the "region lean in catalyzing material." If that were the case, then Oles would be overcome, because the lean region does extend all the way to the interface. And in Matthias, the entire lean region is actually not annular. However, as the claims are currently constructed, examiner is essentially free to select regions which meet the claim limitations.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT E. FULLER whose telephone number is (571)272-0419. The examiner can normally be reached on Monday thru Friday from 8:00 AM - 5:30 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer H. Gay can be reached on 571-272-7029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Shane Bomar/
Primary Examiner, Art Unit 3676

07/13/2009
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